California High-Speed Train Project

Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Design Variance Report

06/29/2012 ADDENDUM 3 - RFP HSR 11-16

Prepared for
CALIFORNIA High-Speed Rail Authority

Table of Contents

California High-Speed Train Project

DESIGN VARIANCE COVER SHEET

Design Variance Request Number: URS-INF-2-0001

Design Variance Request Title: Horizontal Clearance to UPRR Right of Way

Prepared by:

URS/HMM/Arup a Joint Venture Company	6 Oct 2011
Regional Consultant	Date

PMT Review:

Richard Schmedes	4 Jun 2012
Systems	Date
John Chirco	15 May 2012
Infrastructure	Date
Joseph Metzler	13 Oct 2011
Operations/Maintenance/Safety	Date
Frank Banko	12 Oct 2011
Rolling Stock	Date
Vladimir Kanevsky	3 Nov 2011
Regulatory Approvals	Date
Oliver Hoehne	12 Mar 2012
System Integration	Date

PMT Recommended:

Thomas Tracy	5 Jun 2012
PMT Regional Manager	Date

PMT Approval:

Ken Jong	5 Jun 2012
Engineering Manager	Date

Agency Concurrence:

CHSR Authority Chief Engineer	Date

CHST DESIGN VARIANCE REQUEST FORM

Part 1 – Design Variance Request Information

Title/Subject: Horizontal Clearance to Union Pacific Railroad Right-of-Way

Number: URS-INF-2-0001 **Revision:** 2

Contract Name & Number (Final Design): HSR 06-0003

Region: Fresno to Bakersfield

Location: Fresno

Regional Consultant's / Third Party Design Drawing Reference: TT-D3006, UT-C4041

Date Submitted to RMT & PMT

PREPARED / SUBMITTED BY: NAME: Richard Coffin COMPANY: URS/HMM/Arup A Joint Venture Company SIGNATURE: DATE: 3/29/12	 (Engineering Seal)

**Note design variance numbers will follow the same convention:* "ABC" will abbreviate the name of the firm submitting the variance, "DEF" abbreviates the name of firm receiving the variance request, "X" is the revision number starting from 0, and the last four numbers count the number of total submittals starting from one.

Part 2 – Design Variance Request Information

CHSTP DESIGN REQUIREMENT Include reference to drawings, design criteria, technical memos, specifications	Memo dated 8/30/2010 – Clearances to conventional railroads, Union Pacific Railroad (UPRR) right-of-way (ROW), high-speed train (HST) bridge piers, and highways – TM reference number not available
DESIGN CRITERIA REQUIRING A VARIANCE	Memo dated 8/30/2010 – Clearances to conventional railroads, UPRR ROW, HST bridge piers, and highways (hereafter referred to as "The Memo"). Drawing 1 – HSR in shared corridor with UPRR at grade, in The Memo requires a minimum 12-foot separation between edge of UPRR ROW and face of derailment containment barrier. An extract is shown in Appendix A.
REASON FOR REQUESTING A VARIANCE	The constraints of State Route 99 and Roeding Park limit the corridor width available to HST. Between W Olive Avenue and E Belmont Avenue the HST corridor would be constrained by UPRR on the east and Roeding Park on the west. This location currently contains Golden State Boulevard which would be replaced with the HST corridor. Roeding Park is a Section 4(f) property and is not to be impacted by the footprint of the HST works. The available width between the UPRR ROW and Roeding Park boundary is 70ft. The available width does not allow for a 60-foot wide HST corridor with a 12-foot separation to the UPRR ROW. Achieving the 12-foot separation to UPRR ROW would require either intrusion into Roeding Park or the UPRR ROW, or a substandard HST ROW width. A layout of the design is shown in Appendix B.
JUSTIFICATION FOR VARIANCE	Roeding Park is a Section 4(f) property and is not to be impacted by the footprint of the HST works. The available width between the UPRR ROW and Roeding Park boundary is 70ft. The available width does not allow for a 60-foot wide HST corridor with a 12-foot separation to the UPRR ROW. Achieving the 12-foot separation to UPRR would require either intrusion into Roeding Park or the UPRR ROW, or a substandard HST ROW width. A substandard HST ROW was dismissed due to the construction complexity already required in this area. Adjacent to Roeding Park the HST would be in a trench and would already require a complex construction sequence to achieve the works within 60-foot HST corridor. The proposed configuration is consistent with the approach set out in TM 1.1.21 – Typical Cross-Sections for 15% Design. Drawing number C0303 identifies the HST ROW adjacent to a freight ROW in a shared corridor. Drawing 1 in The Memo also identifies HST ROW adjacent to a freight ROW for any freight carrier that is not UPRR. Therefore it is understood that locating the HST ROW adjacent to the

	UPRR ROW, with an intrusion protection barrier, does not constitute a safety risk beyond the scenarios identified in the above standards. The proposed cross-section of the HST corridor (Appendix B) meets the intrusion protection criteria in Draft TM 2.1.7 Rev 1 dated 21 July 2011. As part of the proposed design a 96-inch storm drain would require relocating. One of the options for rerouting the storm drain is to construct it between the HST alignment and Roeding Park. Increasing the separation between the UPRR and HST in this area would prohibit this storm drain realignment option. North of Clinton Avenue the alignment must tie in to the Merced to Fresno team alignment, which is constrained by State Route 99.
PROPOSED ALTERNATIVE DESIGN REQUIREMENT	Due to the constraints identified a design variance is requested for the separation criteria between HST and UPRR corridors.

Part 3 – Impact Analysis

OPERATIONS	None identified
MAINTENANCE	Access for inspections and maintenance to the UPRR face of the intrusion barrier may be constrained. A walkway would be provided within the HST ROW for inspection and maintenance of the HST face of the intrusion protection barrier. Access for inspection and maintenance along the UPRR face of the intrusion protection barrier would be from the UPRR ROW.
INFRASTRUCTURE	None identified
RAILROAD SYSTEMS	None identified
RELIABILITY / FUNCTIONALITY	None identified
THIRD PARTY (Utility, Freight, Caltrans, RR, other)	Potential issue for UPRR if its ROW were used for vehicle access to the face of the intrusion protection barrier. The Authority should discuss the potential access arrangements with UPRR. The offset from the nearest UPRR track center to the face of the intrusion barrier exceeds the 25ft minimum required by UPRR.
SAFETY AND SECURITY	Safety of the HSR to be assured by means of derailment containment and intrusion protection. Security of the HSR to be assured by robust fencing and intruder alarm systems. The proposed configuration would not introduce any further safety or security risks beyond those that would be reasonably expected from locating the HST corridor adjacent to any other freight railroad. Drawing 3 in TM 1.1.21 and

	Drawing 1 in The Memo identifies an intrusion protection barrier as close at 25ft from the nearest track. The current design meets the standards for separation of HST and all other railroad operators. Therefore it is understood that locating the HST ROW adjacent to the UPRR ROW, with an intrusion protection barrier, does not constitute a safety risk beyond the scenarios identified in the above standards.
DIRECT COST	None identified
OTHER	Construction of the intrusion protect wall would need an access agreement with the UPRR. Alternatively the wall would need to be constructed from within the HST ROW.

Part 4 – Mitigation measures

OPERATIONS	N/A
MAINTENANCE	Access for inspection and maintenance along the UPRR face of the intrusion protection barrier would be from the UPRR ROW. It is anticipated a permit or authorization agreement would be required with the UPRR. The Authority should discuss the potential access arrangements with UPRR. These agreements are needed in order to determine UPRR requirements.
INFRASTRUCTURE	N/A
RAILROAD SYSTEMS	N/A

Part 5 – List of Supporting Documentation to Design Variance Request

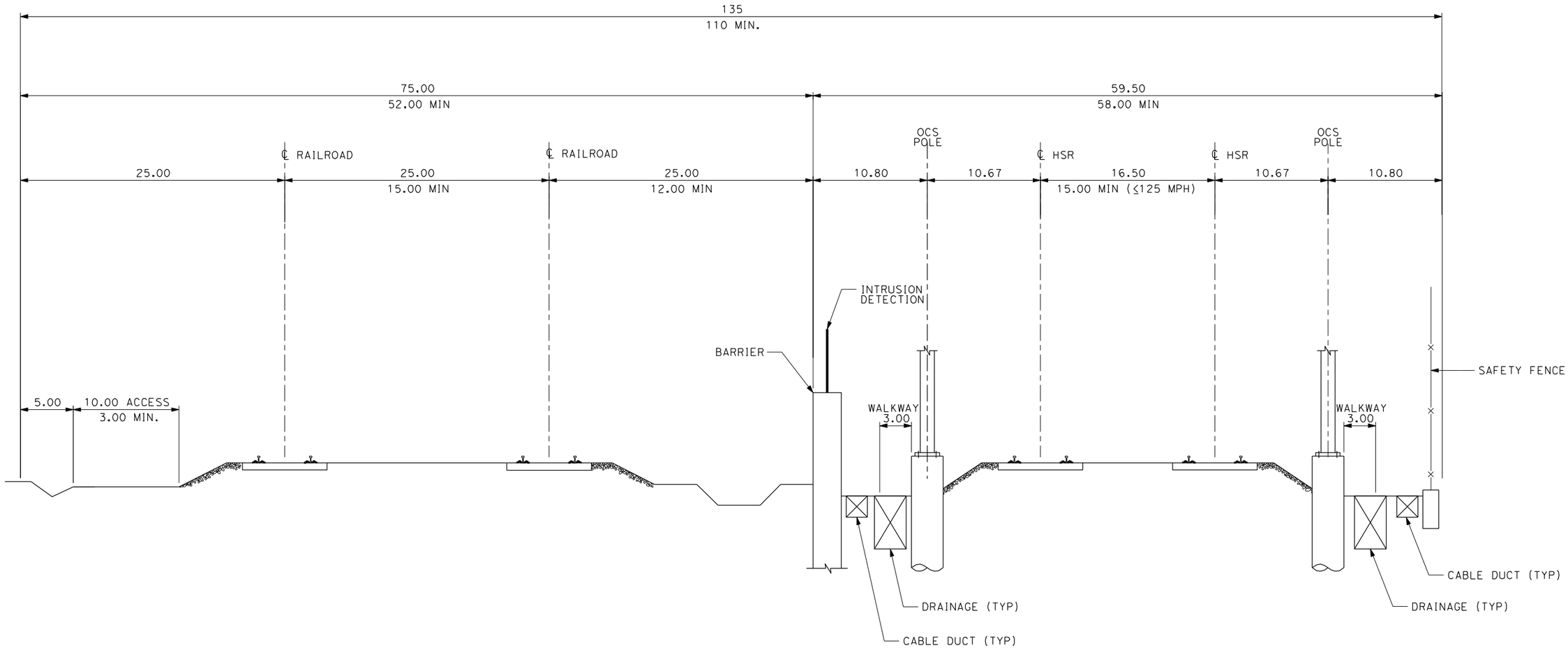
ANALYSIS	N/A
PUBLICATION/STANDARD EXTRACTS	TM1.1.21 Rev 0 – Typical Cross Sections for 15% Design, Drawing C0303 Memo – Clearances to conventional railroads, UPRR ROW, HST bridge piers, and highways, Drawing 1 – TM reference number not available Draft TM 2.1.7 Rev 1 – Rolling Stock and Vehicle Intrusion Protection for High-Speed Rail and Adjacent Transportation Systems, Appendix A
RISK ASSESSMENT	N/A
DRAWINGS	Alignment Plans & Profiles and cross-sections, Drawing TT-D3006 Utilities, Drawing UT-C4041
CALCULATIONS	N/A
EXPERT TESTIMONIALS	N/A
CORRESPONDENCE	As per DV List submitted as part of the Record Set 15% Design (July 2011)
OTHER	N/A

Appendix A – Design Standards Extracts

Extract 1: TM 1.1.21 Rev 0 – Typical Cross Sections for 15% Design, Drawing C0303

Extract 2: The Memo – Clearances to conventional railroads, UPRR ROW, HST bridge piers, and highways, Drawing – HSR in shared corridor at-grade, and Drawing – HSR in shared corridor with UPRR at-grade

Extract 3: Draft TM 2.1.7 Rev 1 – Rolling Stock and Vehicle Intrusion Protection for High-Speed Rail and Adjacent Transport Systems, Appendix A



TYPICAL SECTION
HSR IN RAIL - SHARED CORRIDOR

NOTES:

1. TRACK, OCS POLES AND FOUNDATIONS, CABLE DUCTS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. DRAINAGE MANHOLES AND OCS FOUNDATIONS ARE OFFSET ALONG TRACK IN PLAN VIEW.
3. RIGHT-OF-WAY REQUIRED FOR THE HIGH-SPEED RAIL GUIDEWAY WILL DEPEND UPON CONDITIONS ALONG THE ALIGNMENT, INCLUDING TERRAIN, WHERE CUT/FILL SLOPES, RETAINING STRUCTURES, AND ACCESS ARE REQUIRED.

5 0 5 10
1"=5'

REV	DATE	BY	SUB	APP	DESCRIPTION
					INTERNAL DRAFT

DESIGNED BY D. RULENS
DRAWN BY A. CHEUNG
CHECKED BY J. CHIRCO
IN CHARGE K. JONG
DATE 4-01-09

REGIONAL ENGINEERING CONSULTANT / LOGO

CALIFORNIA HIGH-SPEED RAIL AUTHORITY
FLYCALIFORNIA
Without ever leaving the ground.

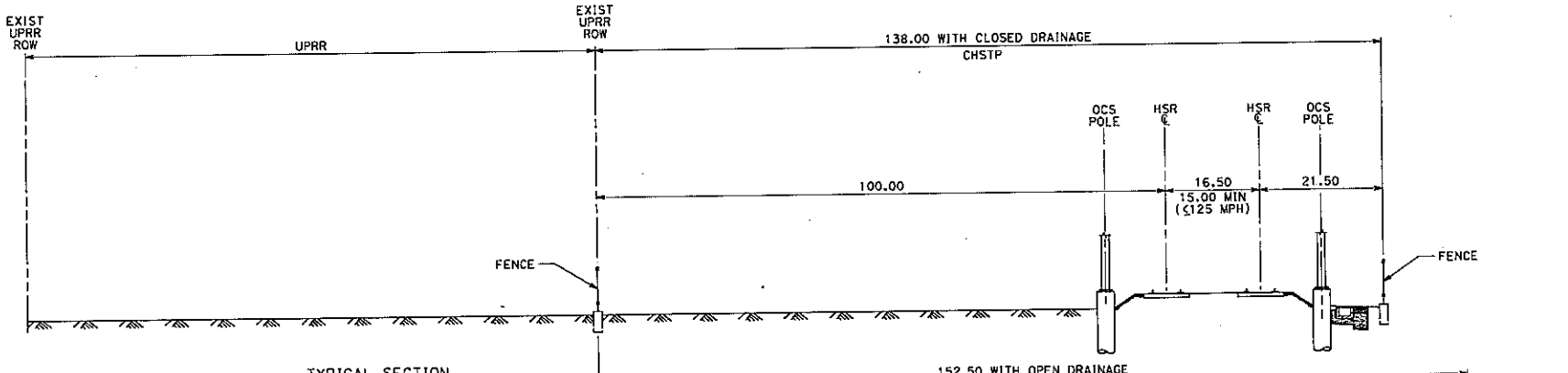
CALIFORNIA HIGH-SPEED TRAIN PROJECT

HSR - SHARED CORRIDOR
AT-GRADE

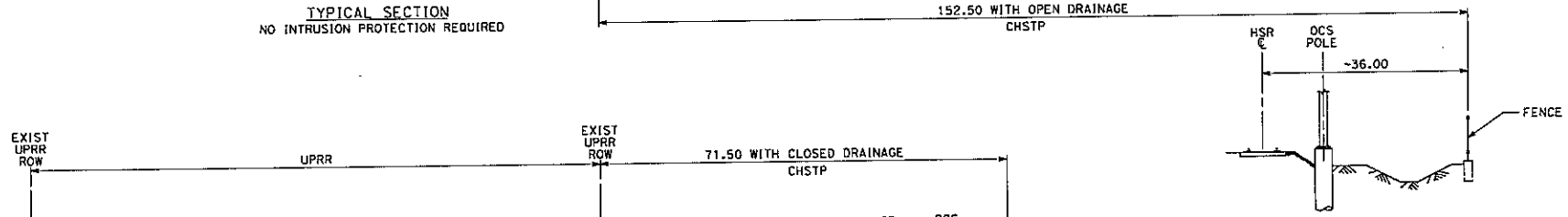
CONTRACT NO. 13259
DRAWING NO. C0303
SCALE AS SHOWN
SHEET NO. ### OF ###

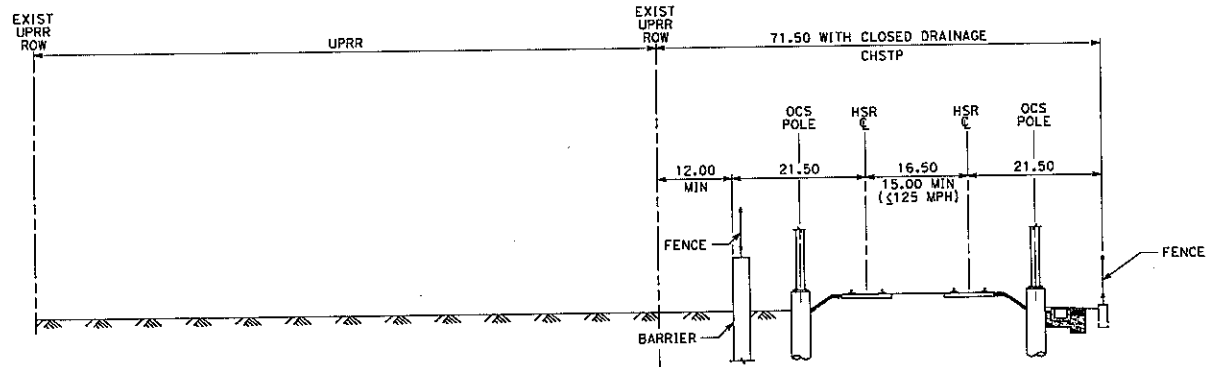
06/29/2012 ADDENDUM 3 - RFP HSR 11-16

4/3/2009 1:38:23 PM T:\13259B Calif High Speed Rail\CADD\Updated Figures\Cross Sections\PRO-C-0303.dgn cheung

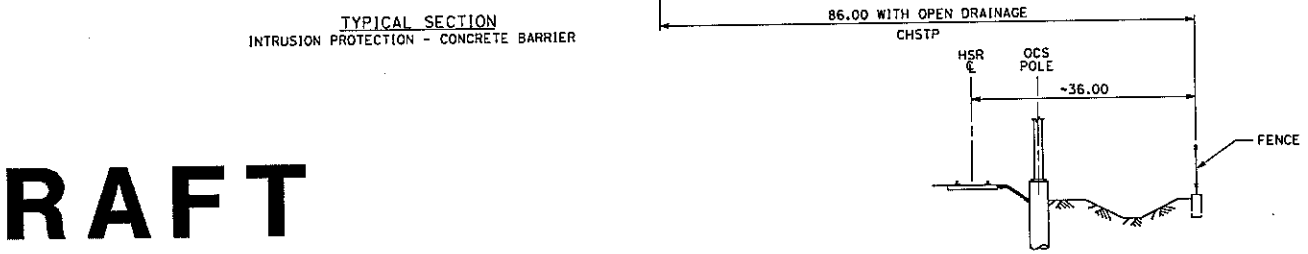


TYPICAL SECTION
NO INTRUSION PROTECTION REQUIRED





TYPICAL SECTION
INTRUSION PROTECTION - CONCRETE BARRIER



NOTES:

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2. DRAINAGE MANHOLES AND OCS FOUNDATIONS ARE OFFSET ALONG TRACK IN PLAN VIEW.
3. RIGHT-OF-WAY REQUIRED FOR THE HIGH-SPEEI RAIL GUIDEWAY WILL DEPEND UPON CONDITION ALONG THE ALIGNMENT, INCLUDING TERRAIN, WHERE CUT/FILL SLOPES, RETAINING STRUCTURES, AND ACCESS ARE REQUIRED.

10 0 10 20
1"=10'

06/29/2012 ADDENDUM 3 - RFP HSR 11-16

DRAFT

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE

PB PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED RAIL AUTHORITY
FLY CALIFORNIA
Without ever leaving the ground.

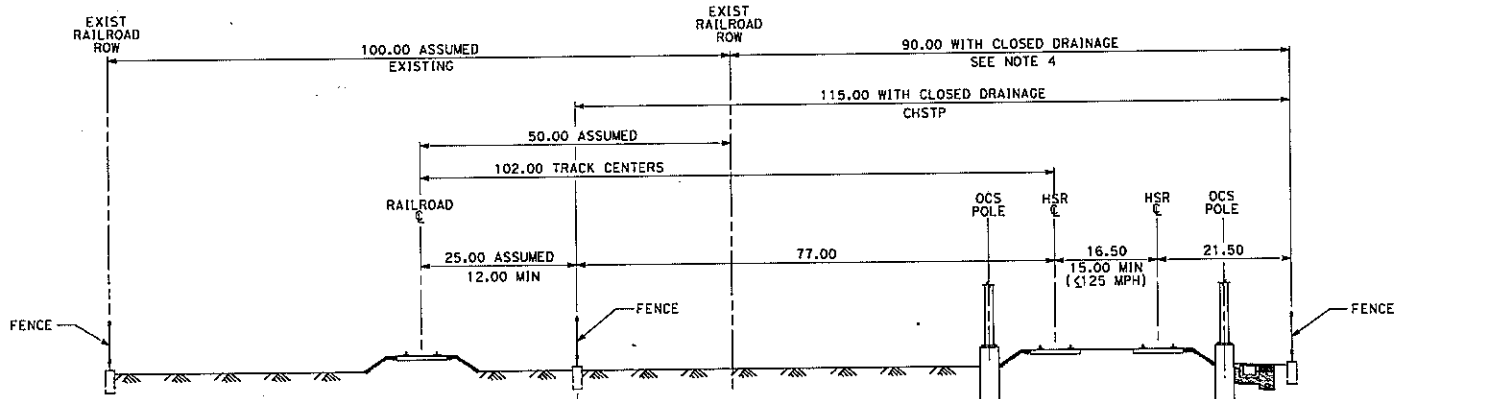
CALIFORNIA HIGH-SPEED TRAIN PROJECT

HSR IN SHARED CORRIDOR WITH UPRR

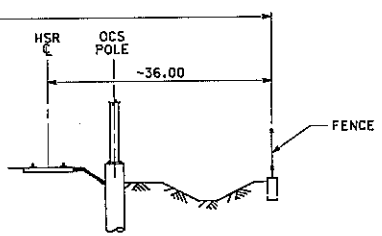
AT-GRADE

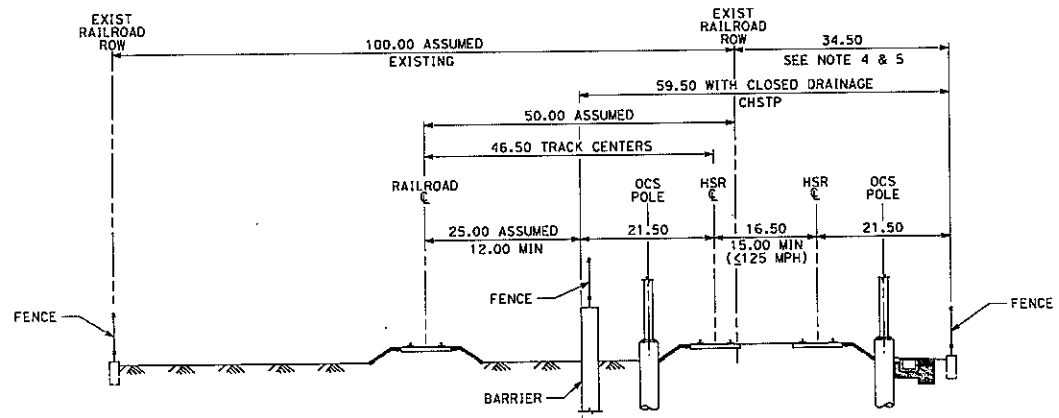
CONTRACT NO.
DRAWING NO.
SCALE 1"=10'-
SHEET NO.

8/30/2010 2:25:16 PM C:\Users\JGO\Desktop\Shared Corridor\HSR in shared corridor-2.dgn
JGO

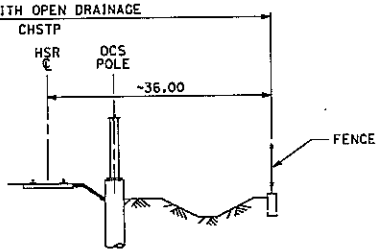


TYPICAL SECTION
NO INTRUSION PROTECTION REQUIRED





TYPICAL SECTION
INTRUSION PROTECTION - CONCRETE BARRIER



DRAFT

NOTES:

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4. ASSUMES RAILROAD ℄ IS 50.00 FROM EXIST RAILROAD ROW.
5. ASSUMES RAILROAD ℄ IS 25.00 FROM BARRIER.

10 0 10 20
1"=10'

06/29/2012 ADDENDUM 3 - RFP HSR 11-16

8/30/2010 2:21:54 PM C:\Users\JCO\Desktop\Shared Corridor-VHSR in shared corridor-2.cgn

JCO

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE

PB PARSONS BRINCKERHOFF

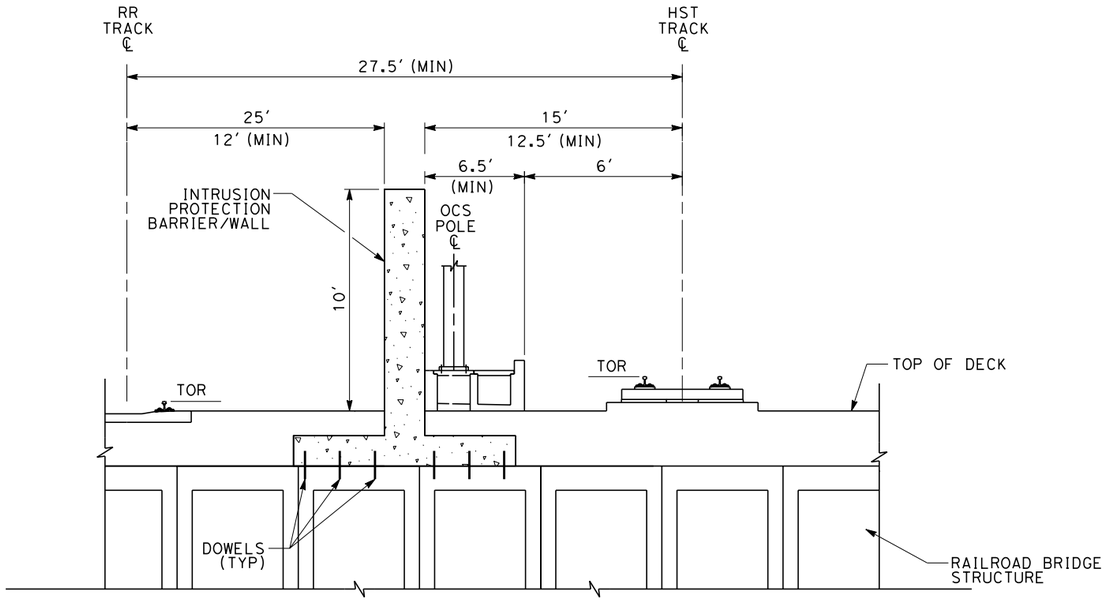
CALIFORNIA HIGH-SPEED RAIL AUTHORITY
FLY CALIFORNIA
Without ever leaving the ground.

CALIFORNIA HIGH-SPEED TRAIN PROJECT

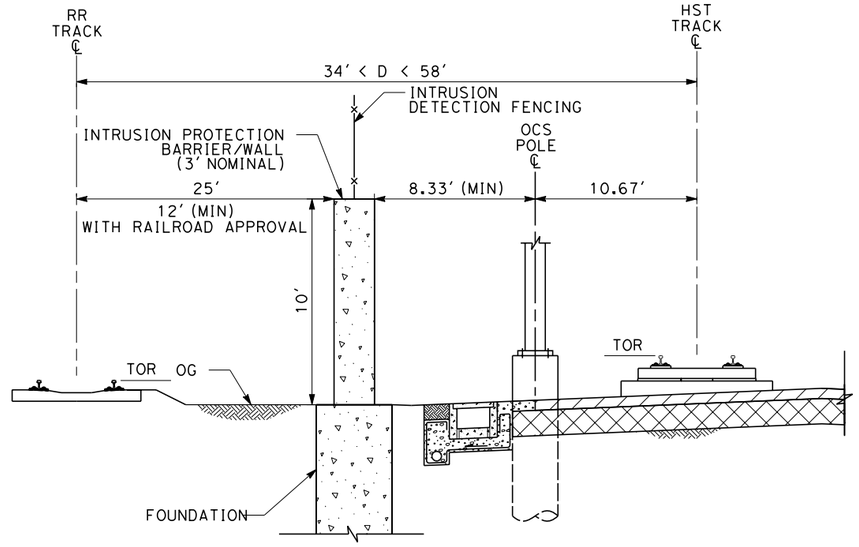
HSR IN SHARED CORRIDOR

AT-GRADE

CONTRACT NO.
DRAWING NO.
SCALE 1"=10'-0"
SHEET NO.



ELEVATED SHARED CORRIDOR



AT-GRADE SHARED CORRIDOR

INTERNAL DRAFT

06/29/2012 ADDENDUM 3 - RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION
					INTERNAL DRAFT

DESIGNED BY A. ABTAHI
DRAWN BY D. SO
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 04/29/11

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
TECHNICAL MEMORANDUM

INTRUSION PROTECTION
BARRIERS IN SHARED CORRIDOR

CONTRACT NO. 13259
DRAWING NO. TM 2.1.7-B
SCALE NO SCALE
SHEET NO.

Appendix B – Alignment Plan Layout and Cross-Section

N ARTHUR AVE

"OLI"

110 MPH CROSSOVER
STA. S10876+00.00

S1 ℄

S2 ℄

"S"

"S" 10875+88.70 POT =
"OLI" 21+83.13 POC

OLIVE AVE
ROADWAY GRADE
SEPARATION ALIGNMENT
(SEE DRAWING CV-T1007)

60.00'
VARIES

ROADWAY TO
BE CLOSED

UPRR ROW
PROP ROW

70.30'

PROP ROW

UPPR ROW
PROP ROW

ROEDING PARK ROW

70.28'

60.00'
VARIES

TS"S2" 10903+08.70

S1 ℄

S2 ℄

ROADWAY TO
BE CLOSED

ACCESS ROAD

ACCESS EASEMENT

S10875+00

S10880+00

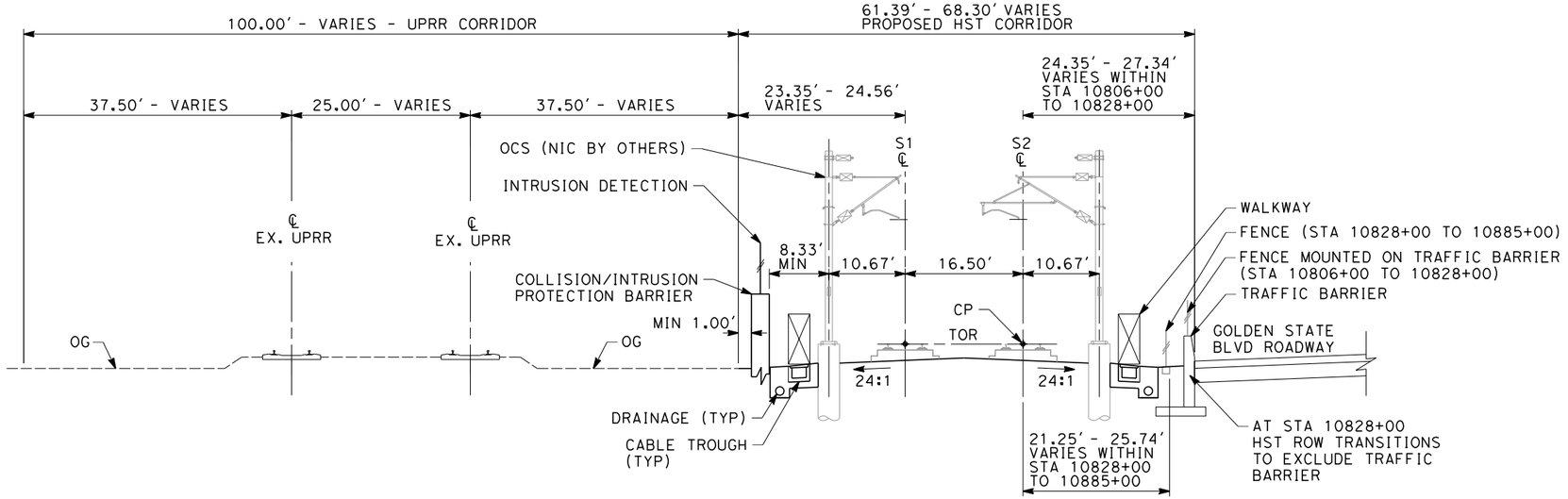
S10885+00

S10890+00

S10895+00

S10900+00

S10905+00

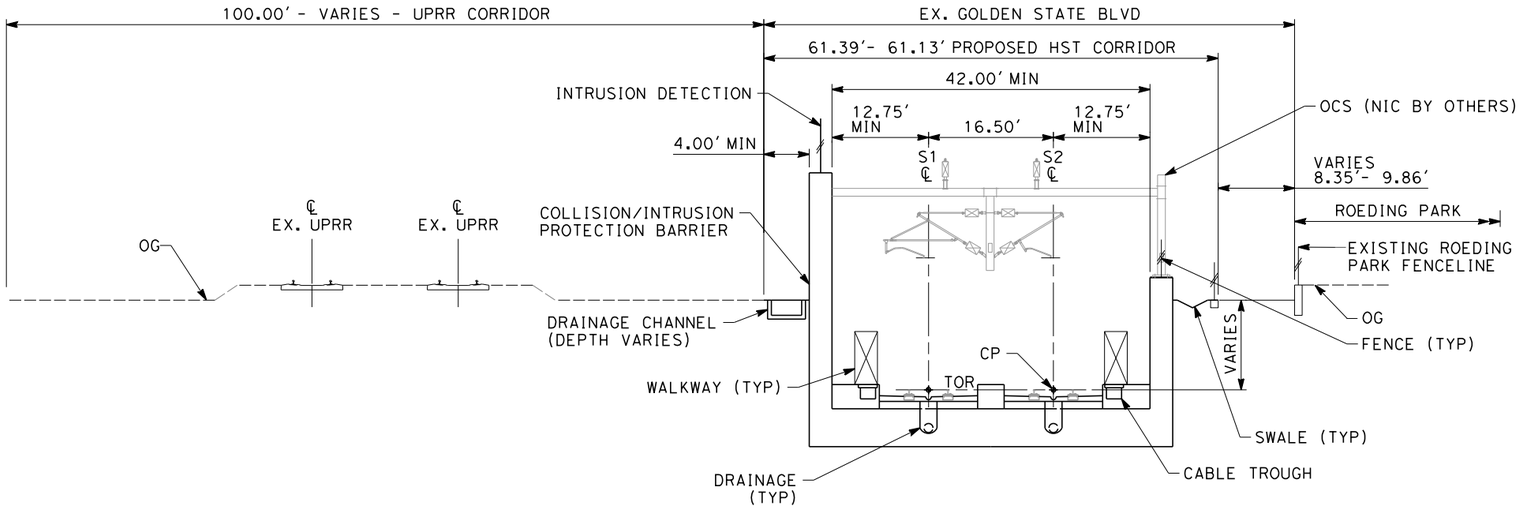


SECTION 11

"S" 10806+00 THROUGH 10885+00
TWIN TRACK AT GRADE ADJACENT TO UPRR

NOTES:

1. TRACKFORM SHOWN FOR INFORMATION ONLY (NIC BY OTHERS).
2. FOR STRUCTURE DIMENSIONS SEE STRUCTURAL TYPICAL SECTIONS.
3. SUPERELEVATION IS NOT SHOWN. THE AMOUNT OF APPLIED SUPERELEVATION IS SHOWN IN THE CURVE DATA TABLES.
4. COLLISION/INTRUSION PROTECTION BARRIER REQUIRED FROM STA 10806+00 - 10950+30



SECTION 12

"S" 10885+00 THROUGH 10902+50
TWIN TRACK IN GRADE SEPARATION ADJACENT TO UPRR AND ROEDING PARK

10 0 10 20
1"=10'
SCALE APPLICABLE FOR FULL SIZE ONLY

06/29/2012 ADDENDUM 3 - RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY K. SEYMOUR
DRAWN BY P. TONKIN
CHECKED BY D. HUNT
IN CHARGE R. COFFIN
DATE 12/08/11

PROPOSED PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION
PACKAGE 1A
TRACK GUIDEWAY
TYPICAL SECTIONS

CONTRACT NO.
DRAWING NO. TT-D3006
SCALE AS SHOWN
SHEET NO.

Appendix C – Potential Storm Drain Relocation

UTILITY INFORMATION

NO.	FACILITY	SIZE	OWNER	DISPOSITION
1	OH TELECOM	NA	UNKNOWN	RELOCATE
2	SEWER	8" TO 10"	CITY OF FRESNO	RELOCATE
3	GAS	16"	PG&E	REMOVE
4	OH POWER	UNKNOWN	PG&E	RELOCATE
5	STORM DRAIN	15" TO 96"	FMFCD	RELOCATE
6	GAS	16"	PG&E	PROPOSED
7	RECYCLED WATER	12"	CITY OF FRESNO	FUTURE (BY OTHERS)
8	WATER	8" TO 12"	CITY OF FRESNO	RELOCATE
9	STORM DRAIN	18"	CITY OF FRESNO	FUTURE (BY OTHERS)
10	SEWER	8"	CITY OF FRESNO	REMOVE

MATCH LINE (UT-C4052)

N ADOLINE AVE

N ARTHUR AVE

N VAGEDES AVE

N WEBER AVE

SEE UTILITY PROTECTION AND RELOCATION PLANS FOR DETAILS

BIKE LANE

UPRR

PROP ROW

N GOLDEN STATE BLVD

"S"

N MODEL DR

S1 ℄

S2 ℄

S10900+00

S10905+00

S109

MATCH LINE (UT-C4040)

MATCH LINE (UT-C4042)

SURFACE DRAINAGE POINT OF CONNECTION

POTENTIAL COMMUNICATION SITE (NIC BY OTHERS)

ACCESS EASEMENT

ROEDING PARK

50 0 50 100

1"=50' HOR

SCALE APPLICABLE FOR FULL SIZE ONLY

MATCH LINE (UT-C4051)

06/29/2012 ADDENDUM 3 - RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY C. ALLEN
DRAWN BY C. DOEHNE
CHECKED BY M. POLISCHUK
IN CHARGE J. LABANOWSKI
DATE 12/08/11

PROPOSED PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

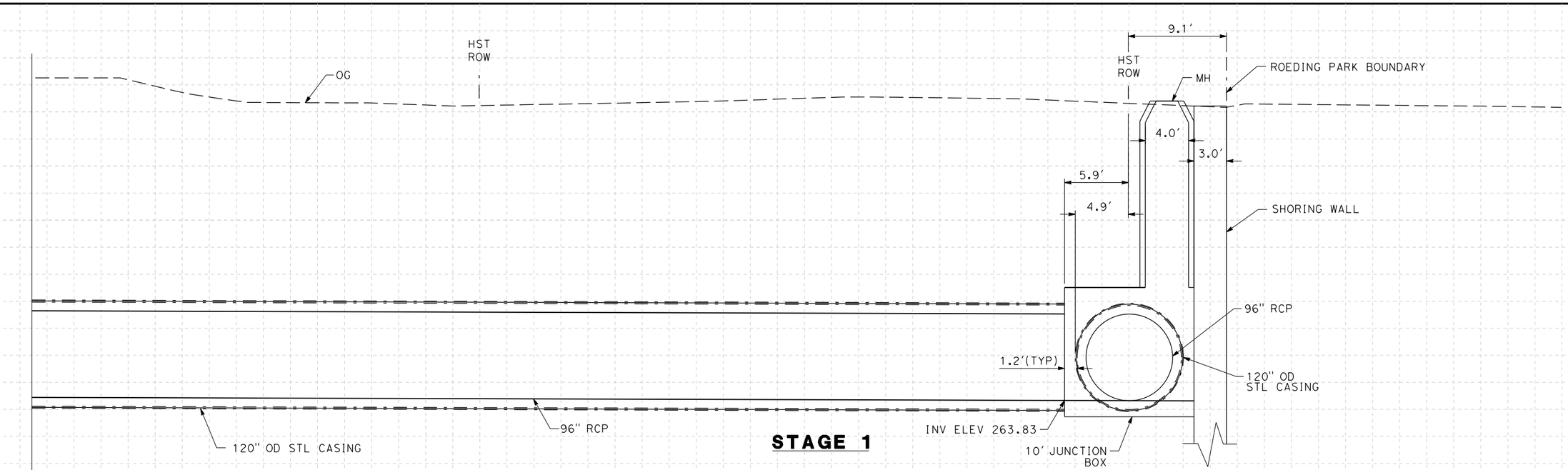
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

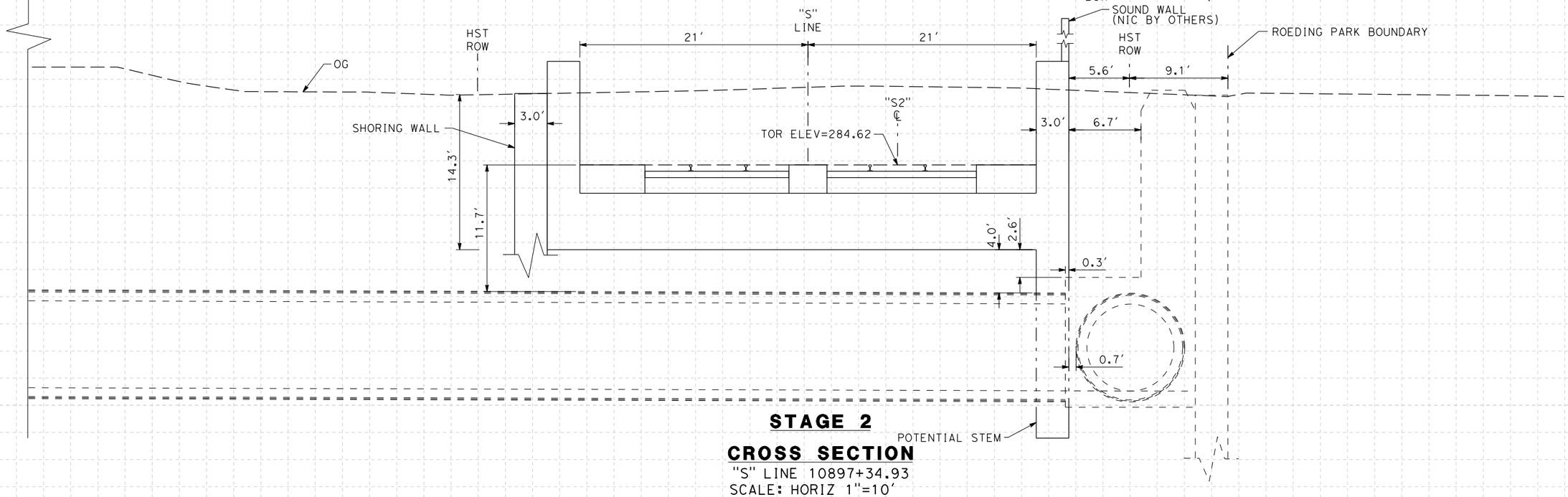
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION
PACKAGE 1A
UTILITIES
COMPOSITE UTILITY PLAN
STA. 10895+00 TO STA. 10910+00

CONTRACT NO.
DRAWING NO. UT-C4041
SCALE AS SHOWN
SHEET NO.

mark_polischuk 12/8/2011 10:53:32 AM CAHSRP-r1.tbl CHSR_PDF_half_black.plt P:\27560808\03-RPLANS\MASTERS\30% Procurement\Sheet Files\Package #1\UTC\FB-UT-C4041-PK1A.dgn



STAGE 1



STAGE 2

CROSS SECTION

"S" LINE 10897+34.93
SCALE: HORIZ 1"=10′
VERT 1"=10′

STATION		TOTAL
CY	Exc	
	Emb	

06/29/2012 ADDENDUM 3 - RFP HSR 11-16

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
FRESNO TO BAKERSFIELD
CROSS SECTION
ALTERNATIVE 1
"S" LINE 10897+34.93

DRAWN BY C. ALLEN
CHECKED BY J. LABANOWSKI
DATE 12/01/11

carlton_allen 12/16/2011 12:01:54 PM 10897+34_1.dgn

California High-Speed Train Project

DESIGN VARIANCE COVER SHEET

Design Variance Request Number: URS-INF-2-0003

Design Variance Request Title: Vertical Element Lengths within Fresno Grade Separation

Prepared by:

URS/HMM/Arup a Joint Venture Company	29 Mar 2012
Regional Consultant	Date

PMT Review:

Richard Schmedes	7 Nov 2011
Systems	Date
John Chirco	15 May 2012
Infrastructure	Date
Joseph Metzler	4 June 2012
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Engineering Manager	Date

Agency Concurrence:

CHSR Authority Chief Engineer	Date

CHST DESIGN VARIANCE REQUEST FORM

Part 1 – Design Variance Request Information

Title/Subject: Vertical Element Lengths within Fresno Grade Separation

Number: URS-INF-2-0003 **Revision:** 0

Contract Name & Number (Final Design): HSR 06-0003

Region: Fresno to Bakersfield

Location: Fresno

Regional Consultant's / Third Party Design Drawing Reference:

Date Submitted to RMT & PMT

PREPARED / SUBMITTED BY: NAME: Richard Coffin COMPANY: URS/HMM/Arup A Joint Venture Company SIGNATURE: DATE: 3/29/12	 (Engineering Seal)

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Part 2 – Design Variance Request Information

CHSTP DESIGN REQUIREMENT Include reference to drawings, design criteria, technical memos, specifications	TM 2.1.2 Rev 0 – Alignment Standards for High-Speed Train Operations
DESIGN CRITERIA REQUIRING A VARIANCE	The design speed of the two vertical curves between (STA 10878+82 to 10941+75) would be reduced from 250mph to 220mph. The maximum operating speed of 220mph will not be affected; however, future operating speeds of up to 250mph would be precluded. The vertical curve lengths of 2,000ft and 3,300ft are within exceptional criteria as defined in Section 6.1.6. Vertical curve overlap with horizontal spiral defined in Section 6.1.7.
REASON FOR REQUESTING A VARIANCE	The San Joaquin Valley Railroad (SJVR), Dry Creek Canal, and SR-180 all exist within close proximity in North Fresno (between STA 10934+00 and 10940+00). The SJVR is at grade with Dry Creek Canal passing approximately 10ft below and SR-180 elevated approximately 30ft above. An at-grade high-speed train (HST) alignment would require severance of the SJVR connection to the Union Pacific Railroad (UPRR) or a grade separation of the SJVR spur with extensive works to reconnect to the UPRR mainline. Both would require extensive schedule extensions to gain the necessary agreements. There is insufficient clearance to pass HST alignment between SJVR and SR-180. Elevating above SR-180 requires a viaduct approximately 65ft in height and has been discounted during the 15% design process. The HST alignment is therefore to be grade separated below all existing crossings. The existing SJVR bridge over Dry Creek Canal has a shallow construction depth. To replace the bridge while maintaining current water levels, the SJVR is to be raised approximately 3ft. Dry Creek Canal cannot be closed or permanently diverted. Minimizing the impact of the HST trench requires the alignment vertical curves and straights to be as short as practicable.
JUSTIFICATION FOR VARIANCE	The proposed design (red line — within exceptional alignment criteria at 220mph) minimizes the extents of trench and the distance between the

	proposed station and crossovers. The trench is 7,940ft long with a maximum depth of 42ft.The vertical curves are 2,000ft and 3,300ft long, respectively, and are approximately midrange between minimum criteria and exceptional criteria. The connecting straight meets minimum criteria. The distance between the station and the crossovers requires a design variance and will be made worse by the minimum (green line) and desirable (blue line) vertical alignments. Options for a 220mph desirable vertical alignment and a 220mph minimum vertical are shown in Appendix A. Significant differences to the proposed scheme are detailed below. **Impacts of the 220mph desirable trench (blue line):** A 220mph alignment that meets the desirable criteria would also allow for 250mph at minimum criteria. The total length of trench is 11,680ft with a maximum depth of 54ft. The crossovers are moved a further 3,060ft away from the station. This significantly worsens the crossover to station distance design variance. **Impacts of the 220mph minimum trench (green line):** The total length of trench is 9,700ft with a maximum depth of 48ft. The crossovers are moved a further 1,410ft away from the station. This worsens the crossover to station distance design variance. The preceding vertical curve at STA 10836+14 is moved north 1,400ft to create sufficient length for the crossovers. This has no significant impact.
PROPOSED ALTERNATIVE DESIGN REQUIREMENT	The proposed 220mph exceptional (red line) alignment represents a balance between achieving the minimum criteria and minimizing crossover to station distance and trench length.

Summary of options:

Option	Speed (mph)	Length (ft)	Criteria
Blue	220	VC1=2400	Desirable
		STR=1475	Desirable
		VC2=5300	Desirable
Green	220	VC1= 2500	Minimum
		STR=858	Minimum
		VC2=4350	Minimum
Red	220	VC1= 2000	Exceptional
		STR=993	Minimum
		VC2=3300	Exceptional

Overlap of vertical curve and horizontal spiral:

The location of the vertical curve is constrained by the requirement to pass under the existing structure at SR-99, the proposed Dry Creek culvert and the SJVR. The overlap between the elements is approximately 3,440ft for the red line and 4,000ft for the blue and green lines. Extending the straight approaching the station back through the horizontal curves and spirals would create a trench in excess of 100ft deep. This is shown by an orange dashed line in the appended drawings. This is considered unreasonable.

Part 3 – Impact Analysis

OPERATIONS	The Authority's operations team should analyze the impact of moving the crossovers further from the station. The 220mph exceptional alignment precludes the ability to increase operating speeds up to 250mph in the future. Passenger comfort will be adversely affected by the greater vertical forces and shorter duration between crest and sag.
MAINTENANCE	The reduced vertical curve radii may increase the maintenance requirements through increased rail wear. The shorter and shallower trench may reduce structure maintenance expenses.
INFRASTRUCTURE	The exceptional (red line) alignment requires a shorter and shallower trench structure.
RAILROAD SYSTEMS	None identified
RELIABILITY / FUNCTIONALITY	None identified
THIRD PARTY (Utility, Freight, Caltrans, RR, other)	None identified

SAFETY AND SECURITY	The proposed design is within acceptable range for exceptional radii in the design standards. Therefore the design would not pose a safety risk above those accepted in the design standards.
DIRECT COST	The overall cost has not been assessed; however, it is clear that the 220mph desirable (blue line) option would increase the construction quantities compared to the exceptional design through the increased length and depth of the trench structure. The 220mph minimum (green line) would increase the construction quantities to a lesser degree.
OTHER	None identified

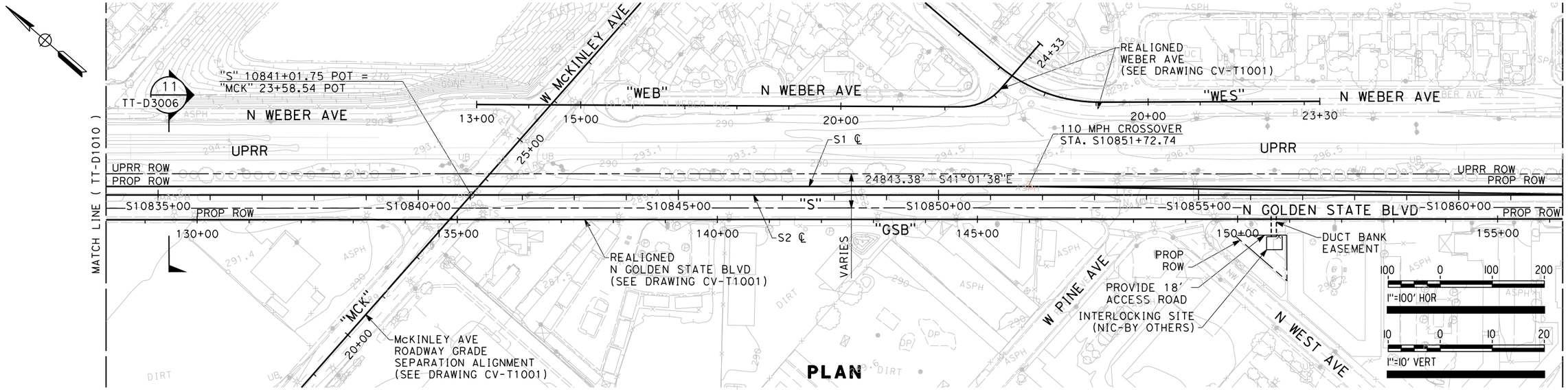
Part 4 – Mitigation measures

OPERATIONS	The exceptional (red line) alignment has the least operational impact due to minimizing the crossovers to station distance. The Authority's operations team should perform an analysis to determine the value of minimizing the crossover to station distance.
MAINTENANCE	The curve lengths are not the absolute exceptional values. They represent a balance between trench cost and crossover to station distance against track maintenance requirements.
INFRASTRUCTURE	Increased inspection may mitigate maintenance issues.
RAILROAD SYSTEMS	None identified

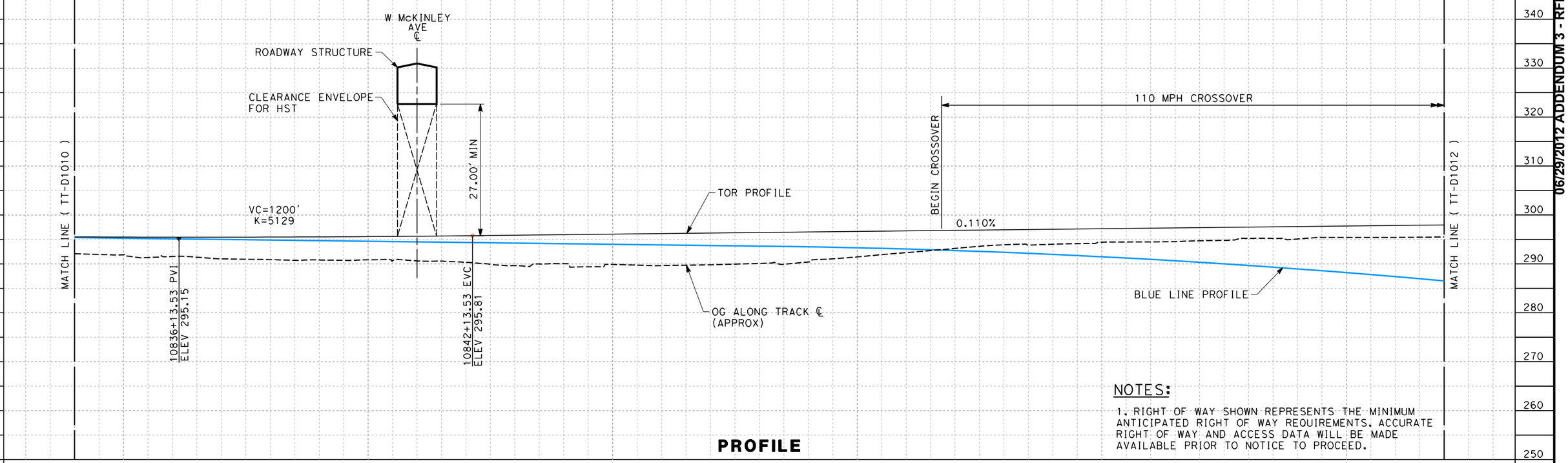
Part 5 – List of Supporting Documentation to Design Variance Request

ANALYSIS	N/A
PUBLICATION/STANDARD EXTRACTS	TM 2.1.2 Rev 0 – Alignment Standards for High-Speed Train Operations TM 2.1.3 Rev 0 – Turnout and Station Tracks
RISK ASSESSMENT	N/A
DRAWINGS	Alignment plan and profile drawings
CALCULATIONS	N/A
EXPERT TESTIMONIALS	N/A
CORRESPONDENCE	N/A
OTHER	N/A

Appendix A – Option Layouts



PLAN



PROFILE

NOTES:

1. RIGHT OF WAY SHOWN REPRESENTS THE MINIMUM ANTICIPATED RIGHT OF WAY REQUIREMENTS. ACCURATE RIGHT OF WAY AND ACCESS DATA WILL BE MADE AVAILABLE PRIOR TO NOTICE TO PROCEED.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY K. SEYMOUR
DRAWN BY P. TONKIN
CHECKED BY D. HUNT
IN CHARGE R. COFFIN
DATE 12/08/11

PROPOSED PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

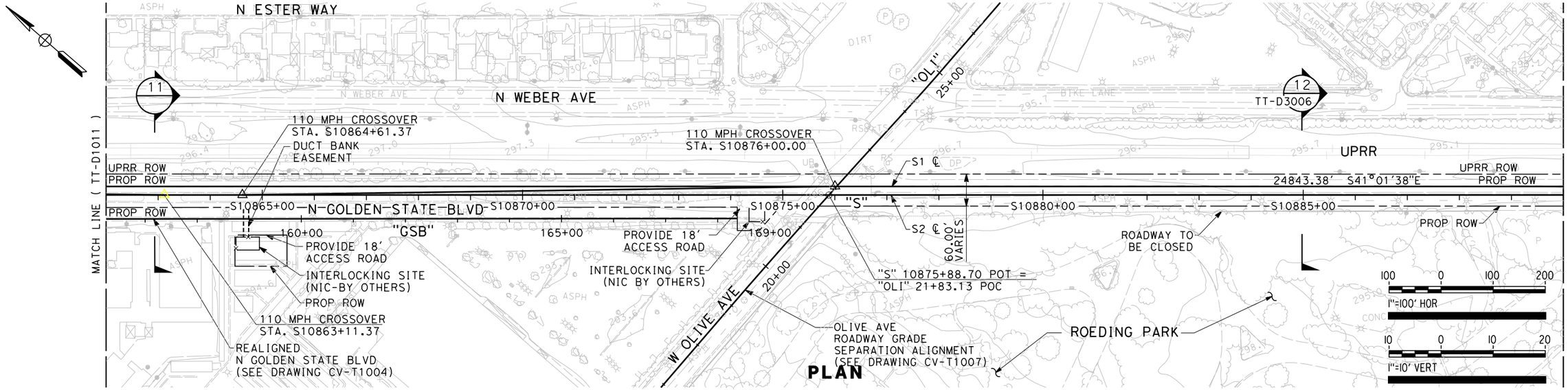
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

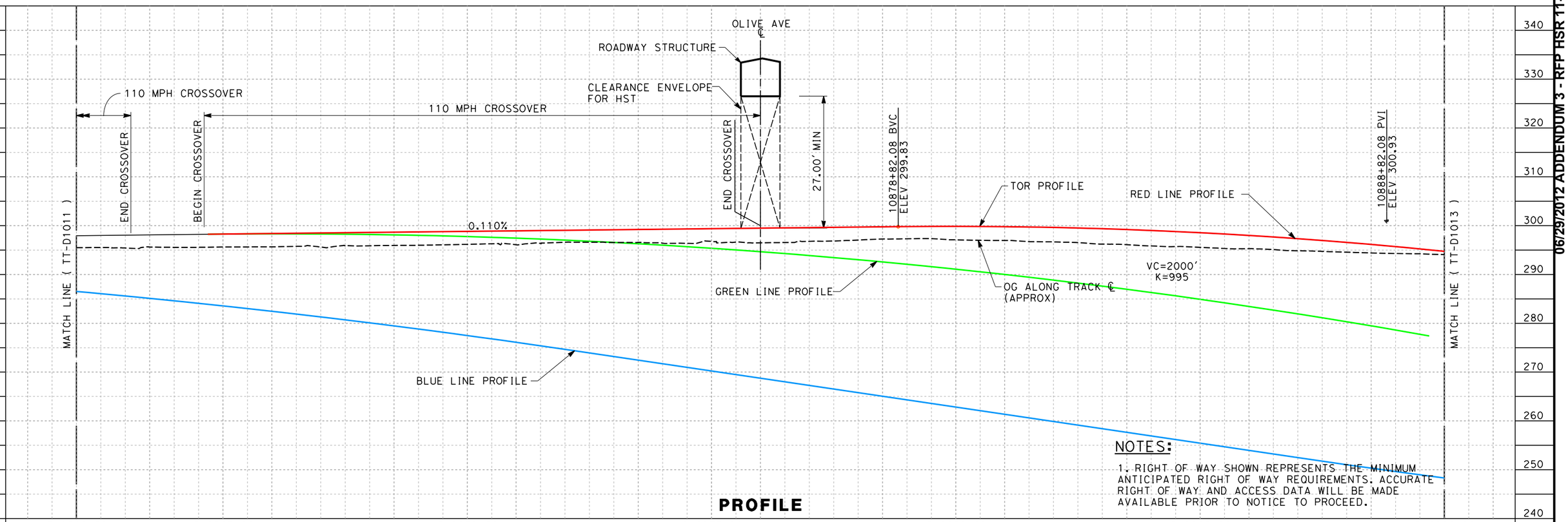
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION
PACKAGE 1A
TRACK GUIDEWAY
PLAN AND PROFILE
STA. 10834+00 TO STA. 10862+00

CONTRACT NO.
DRAWING NO. TT-D1011
SCALE AS SHOWN
SHEET NO.

06/29/2012 ADDENDUM 3 - RFP HSR 11-16





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DRAWN BY P. TONKIN
CHECKED BY D. HUNT
IN CHARGE R. COFFIN
DATE 12/08/11

PROPOSED PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

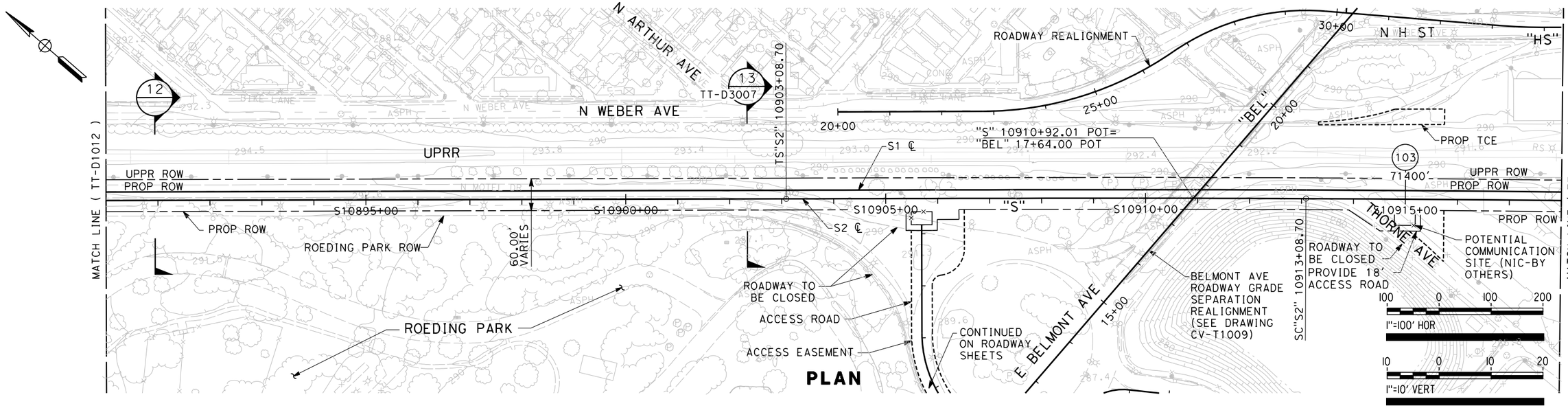
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

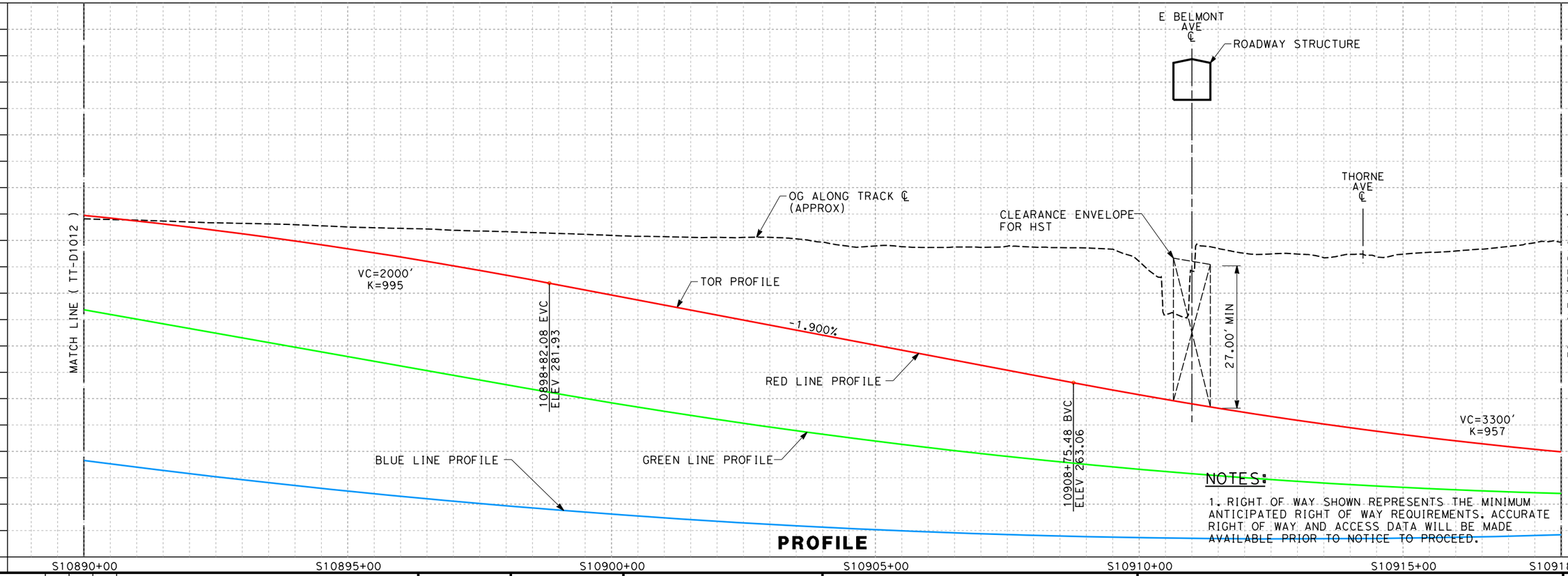
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION
PACKAGE 1A
TRACK GUIDEWAY
PLAN AND PROFILE
STA. 10862+00 TO STA. 10890+00

CONTRACT NO.
DRAWING NO. TT-D1012
SCALE AS SHOWN
SHEET NO.

06/29/2012 ADDENDUM 3 - RFP HSR 11-16



PLAN



PROFILE

NOTES:

1. RIGHT OF WAY SHOWN REPRESENTS THE MINIMUM ANTICIPATED RIGHT OF WAY REQUIREMENTS. ACCURATE RIGHT OF WAY AND ACCESS DATA WILL BE MADE AVAILABLE PRIOR TO NOTICE TO PROCEED.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY K. SEYMOUR
DRAWN BY P. TONKIN
CHECKED BY D. HUNT
IN CHARGE R. PRUST
DATE 12/08/11

PROPOSED PRELIMINARY DESIGN

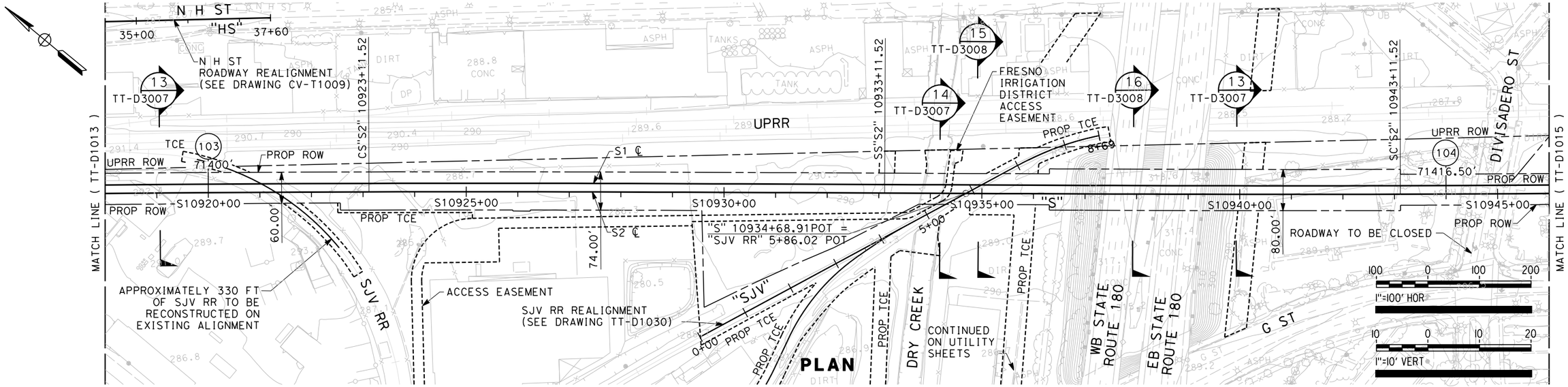
NOT FOR CONSTRUCTION

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION
PACKAGE 1A
TRACK GUIDEWAY
PLAN AND PROFILE
STA. 10890+00 TO STA. 10918+00

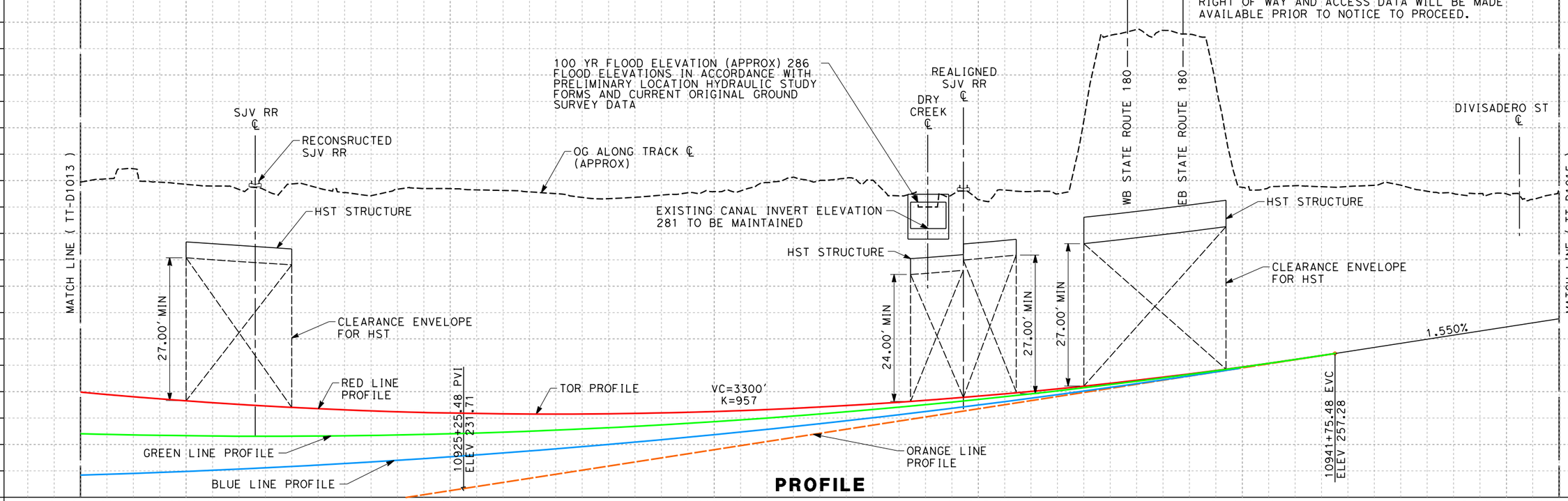
CONTRACT NO.
DRAWING NO. TT-D1013
SCALE AS SHOWN
SHEET NO.



PLAN

NOTES:

1. RIGHT OF WAY SHOWN REPRESENTS THE MINIMUM ANTICIPATED RIGHT OF WAY REQUIREMENTS. ACCURATE RIGHT OF WAY AND ACCESS DATA WILL BE MADE AVAILABLE PRIOR TO NOTICE TO PROCEED.



PROFILE

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY K. SEYMOUR
DRAWN BY P. TONKIN
CHECKED BY D. HUNT
IN CHARGE R. COFFIN
DATE 12/08/11

PROPOSED PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION
PACKAGE 1A
TRACK GUIDEWAY
PLAN AND PROFILE
STA. 10918+00 TO STA. 10946+00

CONTRACT NO.
DRAWING NO. TT-D1014
SCALE AS SHOWN
SHEET NO.

California High-Speed Train Project

DESIGN VARIANCE COVER SHEET

Design Variance Request Number: URS-INF-2-0004

Design Variance Request Title: Dry Creek Structure Clearance

Prepared by:

URS/HMM/Arup a Joint Venture Company	6 Oct 2011
Regional Consultant	Date

PMT Review:

Richard Schmedes	4 Jun 2012
Systems	Date
John Chirco	15 May 2012
Infrastructure	Date
Joseph Metzler	21 Oct 2011
Operations/Maintenance/Safety	Date
Frank Banko	12 Oct 2011
Rolling Stock	Date
Vladimir Kanevsky	3 Nov 2011
Regulatory Approvals	Date
Tony Murphy	18 Nov 2011
System Integration	Date

PMT Recommended:

Thomas Tracy	5 Jun 2012
PMT Regional Manager	Date

PMT Approval:

Ken Jong	5 Jun 2012
Engineering Manager	Date

Agency Concurrence:

CHSR Authority Chief Engineer	Date

CHST DESIGN VARIANCE REQUEST FORM

Part 1 – Design Variance Request Information

Title/Subject: 30-inch Sewer Line/Dry Creek Structure/60-inch Storm Drain Clearance

Number: URS-INF-2-0004 **Revision:** 2

Contract Name & Number (Final Design): HSR 06-0003

Region: Fresno to Bakersfield

Location: Fresno Grade Separation below Dry Creek Canal, SJVR and SR-180

Regional Consultant's / Third Party Design Drawing Reference:

Date Submitted to RMT & PMT

PREPARED / SUBMITTED BY: NAME: James Labanowski COMPANY: URS/HMM/Arup A Joint Venture Company SIGNATURE: James A. Labanowski Jr. DATE: 3/23/12	 (Engineering Seal)

**Note design variance numbers will follow the same convention:* "ABC" will abbreviate the name of the firm submitting the variance, "DEF" abbreviates the name of firm receiving the variance request, "X" is the revision number starting from 0, and the last four numbers count the number of total submittals staring from one.

Part 2 – Design Variance Request Information

CHSTP DESIGN REQUIREMENT Include reference to drawings, design criteria, technical memos, specifications	TM 2.1.2 Rev 0 – Alignment Standards for High-Speed Train Operations TM 3.2.1 Rev 1 – OCS Requirements
DESIGN CRITERIA REQUIRING A VARIANCE	Below-standard clearance of 24ft is proposed to the CHSTP structure below the proposed 30-inch sewer line (STA10933+14), the Dry Creek canal (STA10934+00) and the 60-inch storm drain (STA10935+86). This meets the standard clearance to an existing structure but does not meet the 27-foot clearance required for a new structure.
REASON FOR REQUESTING A VARIANCE	The 30-inch sewer line is currently located at STA10934+56 with an existing invert level of 273.8ft, The invert elevation needs to be maintained at the point of relocation for the system to continue to operate as a gravity system. Dry Creek is located at STA10934+00 with an existing invert level of 281ft, which is to be maintained. The 60-inch storm drain is replacing two separate drain lines at STA 10940+21 and STA10945+18 that would not meet the standard clearance to an existing structure. The relocated invert elevation of 275.7ft needs to be maintained for proper operation of the storm drain as a gravity system. CHSTP is grade separated below Dry Creek. The creek is to be culverted and is required by the PMT to be structurally independent of the proposed CHSTP structure. CHSTP is grade separated below the 30-inch sewer line and the 60-inch storm drain. Both lines will be independent of the proposed CHSTP structure. The CHSTP alignment is to be as shallow as possible to reduce the trench structure cost and the crossover distances to the proposed station.
JUSTIFICATION FOR VARIANCE	Reducing the clearance to 24ft reduces available space for the Overhead Contact System (OCS) equipment. However, 24ft clearance for short spans does not preclude the use of OCS as used for sections where 27ft clearance is provided.

	If the clearance is increased to 27ft, then either an amalgamated Dry Creek culvert/CHSTP structure or a deeper and longer trench structure will be required. The PMT has previously rejected the amalgamated structure in order to separate the maintenance and other liabilities of the canal structure from that of the CHSTP structure. Pumping stations would be necessary to lift the storm drain and sewer lines in order to gain the 27ft clearance required by the Technical Memoranda. The City of Fresno and the Fresno Metropolitan Flood Control District are both highly opposed to pump stations due to increased maintenance and associated liabilities (see Minutes of Meeting, Appendix A). The deeper and longer trench will be significantly more expensive. Deepening the trench may also require wider trench walls and therefore increased right-of-way width. The longer trench structure will lengthen the crossover to station distance. This is already a design variance and will further impact operations.
PROPOSED ALTERNATIVE DESIGN REQUIREMENT	The OCS equipment will be required to be designed such that that no supports are located under the 30-inch sewer line, the Dry Creek culvert or the 60-inch storm drain (see OCS sketches in Appendix A). This is achievable as the contact wire through the section is designed at 17ft 4.7 inches (5300 mm) and with a system height of 5ft 3 inches (1600 mm) results in the messenger wire being 22ft 7.7 inches (6900 mm) at the support structure. Given the above, in the worst case situation with the OCS structure adjacent to any of the three low clearance areas, the clearance from them to the messenger wire would be 14.3 inches (363 mm), which exceeds the required normal static clearance of 1ft 0.6 inch (320 mm). In reality the static clearance will be greater as the messenger wire will sag due to its self weight and that of the contact wire and hangers.

	The OCS equipment will be the same as required by existing structures on the route. The longitudinal negative feeder wire could be placed inside the cantilever with a minimum electrical clearance of 1ft 5.4 inches (440 mm). At the support the feeder wire does not have dynamic movement. Further electrical clearance can be achieved by placing the longitudinal feeder wire in the middle of the tracks, supported from the HST cover slab. This structure is located within a reverse horizontal spiral and vertical sag curve. This is not expected to present any significant issues. The alignment speed is 220mph. The 60 inch storm drain and the 30 inch sewer line would need to be supported across the trench using an external structure (pipe bridge). A number of options for this structure have been considered including a structural concrete encasement and steel tubular casing. Of these options, the required invert level can be achieved with a 1/2" wall thickness tubular steel casing of approx 80" diameter (for the 60" storm drain) with allowance for spacers and packing to permit withdrawal of the drainage pipe. Use of a concrete encasement would require further encroachment on the vertical clearance below 24'. In order to ensure minimum maintenance of the pipe crossings the casing would need to be protected against corrosion. 3 options have been investigated • Paint system specification Blast clean to SSPC SP10 Primer Epoxy 2 mil

	Barrier Glass flake epoxy minimum 30 to 35 mil Finish 2 mil polyurethane • Thermal Sprayed Aluminum Blast clean to SSPC SP5 Thermal sprayed Aluminum 8 to 10 mil (**Note:** this treatment is not suitable for surfaces that will be buried) • Alternate casing material Fabricate casing from Duplex Stainless Steel (Low Nickel content with high structural strength). Requires no further treatment. The durability of these alternatives varies. The "practical life" (time to the point where replacement of the coating is required) of the paint and sprayed aluminum systems is about 30 years. The practical life of the duplex stainless steel is not known and is effectively on a par with the design life of the trench structure (+100 years) All options would be subject to regular maintenance inspections (likely to be annual) by the owner of the utility. The metallic parts of the pipe crossings and the reinforcement of the concrete option would need to be grounded to earth and bonded to the OCS system to avoid dangerous potential differences. Overall we suggest that the stainless steel casing provides the most robust protection for the HST system.

Part 3 – Impact Analysis

OPERATIONS	The proposed option for the Dry Creek Culvert has no operational impact. The proposals for the pipe crossings will require operations to be interrupted to facilitate access by the utility owner to the crossing structures for: • condition inspection • replacement of the corrosion protection system The required intervals for these interruptions will need to be agreed with the utility owners. The alternative lower alignment option will increase the crossover-to-stations distance. PMT operations

	team should analyze the impact of moving the crossovers farther from the station if this is to be considered further.
MAINTENANCE	For the pipe crossings, regular condition inspections would be necessary to verify that the condition of the utility crossing is not a risk to the HST. Additionally, if painting or aluminum metal spray is chosen as the corrosion protection method for the utility casing, allowance would need to be made for stripping and replacement of the protection system at least 3 times in the expected life of the HST structure (assuming a paint system life of 30 years).
INFRASTRUCTURE	None identified
RAILROAD SYSTEMS	The AREMA Standards may be applicable to this system in the absence of any definitive guidance or technical memoranda regarding utility crossings over the HST. The AREMA standards may be regarded as a good guide to the provisions that the HST Authority would find acceptable for such crossings. The AREMA standards for utility crossings over a railway include the following requirements, paraphrased as follows: • Overhead crossings are regarded as a last resort (under-ground crossings are preferred) and Section 5.4.2.1 - requires the proposer to demonstrate due diligence in finding alternative methods of crossing before proposing an overhead crossing. • Section 5.4.2.2 – States that a pipeline facility should not be attached to a railway structure. This clarifies that the HST Authority cannot be the owner of the pipe crossing structure. Consequently, maintenance and inspection of the utility crossing and structure will be the responsibility of the utility owner. This will require access to the structure to be provided by the HST operators. • Section 5.4.3.1 To protect the HST from the effects of leakage utility pipe must be encased. This encasing must extend 25 ft beyond 'back of drainage'. This has been interpreted in this case as equal to 25ft beyond the HST ROW on the West. This may need to extend beyond UPRR ROW to the east. This requirement is interpreted as meaning that the structural

	component of the utility crossing must be the carrier pipe and the casing is therefore non-structural (See also 5.4.4.1.1 below). • Section 5.4.3.2 requires that emergency shut-off valves are provided at each side of the ROW • Section 5.4.4.1.1 requires that the casing pipe shall be assumed to provide no structural support to the carrier pipe, which has been interpreted to mean that the carrier pipe is the structural element. This may preclude a concrete carrier pipe • Section 5.4.4.2.2 requires that the vertical clearance to the utility casing is 25ft minimum above TOR and that 25ft lateral clearance from CL of track to supports. This translates to a minimum span of 66.5' (min span = 25' +25' + 16.5' = 66.5') • Section 5.4.5 requires inspection & maintenance to be carried out on a 'routine basis' (possibly annually).
RELIABILITY / FUNCTIONALITY	AREMA Utilities Crossing Section 5.4.5 requires the development of an emergency response procedure (incorporating a risk analysis) to be developed for all incidents that might jeopardize the integrity of the pipeline.
THIRD PARTY (Utility, Freight, Caltrans, RR, other)	See Railroad Systems above.
SAFETY AND SECURITY	None identified
DIRECT COST	None identified
OTHER	None identified

Part 4 – Mitigation measures

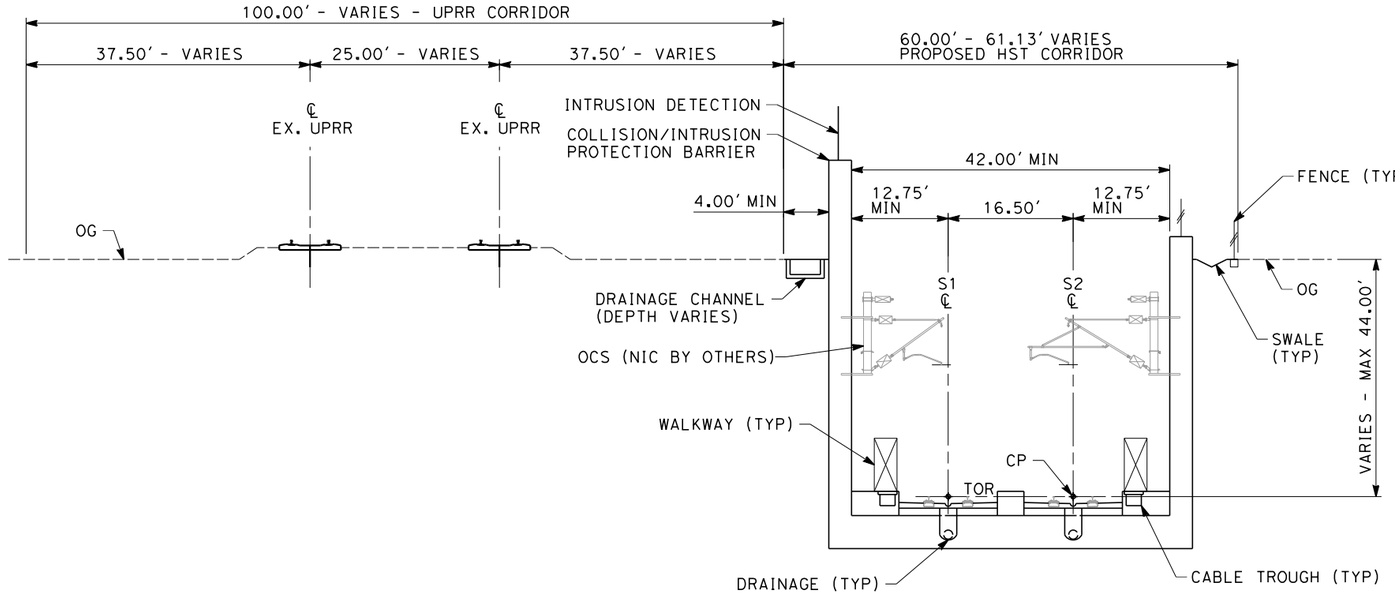
OPERATIONS	The presence of the utility crossing will require HST operations to be planned to accommodate the needs of the utility owners for inspection and maintenance as and when needed.
MAINTENANCE	The design life of the pipe crossings will be required to be the same as the main HST structures.
INFRASTRUCTURE	None identified
RAILROAD SYSTEMS	It is not intended that the catenary support brackets would be fitted to the walls in the section beneath Dry Creek, but they could be in other areas. It may be possible that the catenary can span the entire length of the covered section in which case the catenary support brackets can be located outside the covered area entirely.

Part 5 – List of Supporting Documentation to Design Variance Request

ANALYSIS	N/A

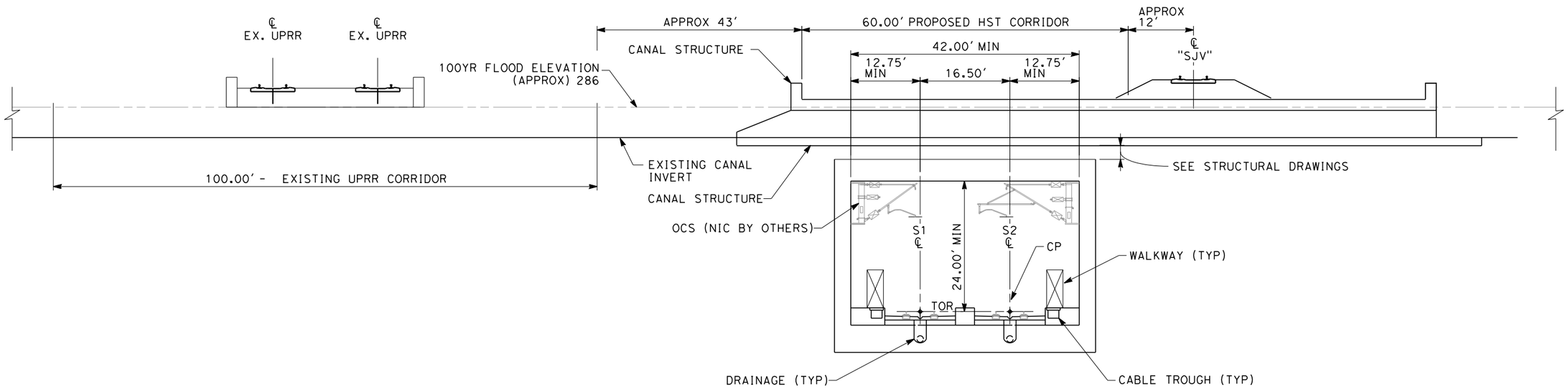
PUBLICATION/STANDARD EXTRACTS	TM 2.1.2 Rev 0 – Alignment Standards for High-Speed Train Operations TM 3.2.1 Rev 1 – OCS Requirements AREMA Standard for Overhead Utility Crossings
RISK ASSESSMENT	N/A
DRAWINGS	Cross-section drawing, TT-D3007 Sketch 1 – Alternative Negative Feeder Location, Sketch 2 – OCS Support Location in 27' Height Clearance Area Sketch 3 – OCS Profile Composite Utility Plan, UT-C4043 Minutes of Meeting
CALCULATIONS	N/A
EXPERT TESTIMONIALS	N/A
CORRESPONDENCE	N/A
OTHER	N/A

Appendix A – Drawings



SECTION 13

"S" 10902+50 THROUGH 10936+95
"S" 10939+55 THROUGH 10951+00
ADJACENT TO UPRR



SECTION 14

"S" 10934+05
TWIN TRACK IN GRADE SEPARATION UNDER CANAL

NOTES:

1. TRACKFORM SHOWN FOR INFORMATION ONLY (NIC BY OTHERS).
2. SUPERELEVATION IS NOT SHOWN. THE AMOUNT OF APPLIED SUPERELEVATION IS SHOWN IN THE CURVE DATA TABLES.
3. FOR STRUCTURAL DIMENSIONS SEE STRUCTURAL TYPICAL SECTIONS.
4. COLLISION/INTRUSION PROTECTION BARRIER REQUIRED FROM STA 10806+00 - 10950+30 AND STA 10990+70 - 11030+00

10 0 10 20
1"=10'
SCALE APPLICABLE FOR FULL SIZE ONLY

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY K. SEYMOUR
DRAWN BY P. TONKIN
CHECKED BY D. HUNT
IN CHARGE R. COFFIN
DATE 12/08/11

PROPOSED PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

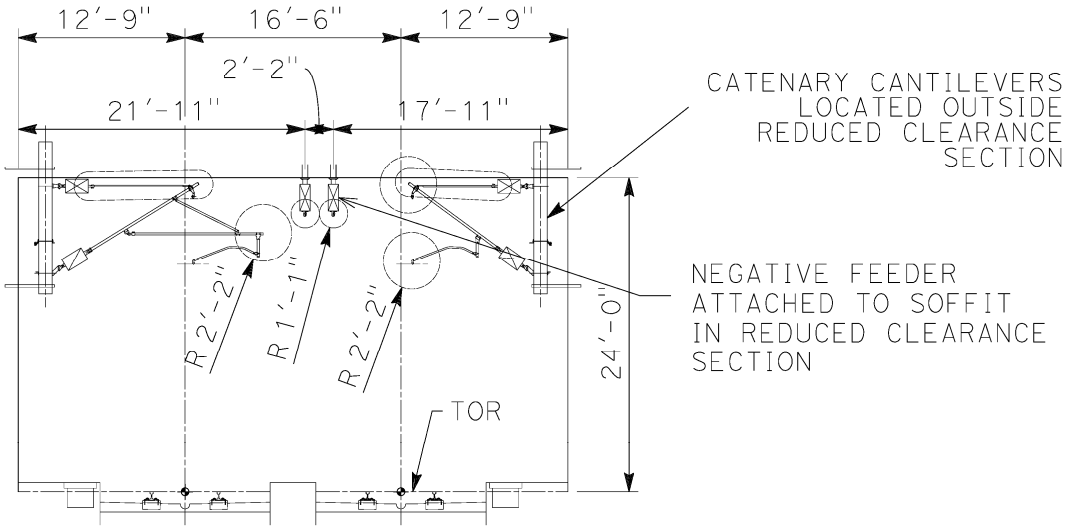
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION
PACKAGE 1A
TRACK GUIDEWAY
TYPICAL SECTIONS

CONTRACT NO.
DRAWING NO. TT-D3007
SCALE AS SHOWN
SHEET NO.

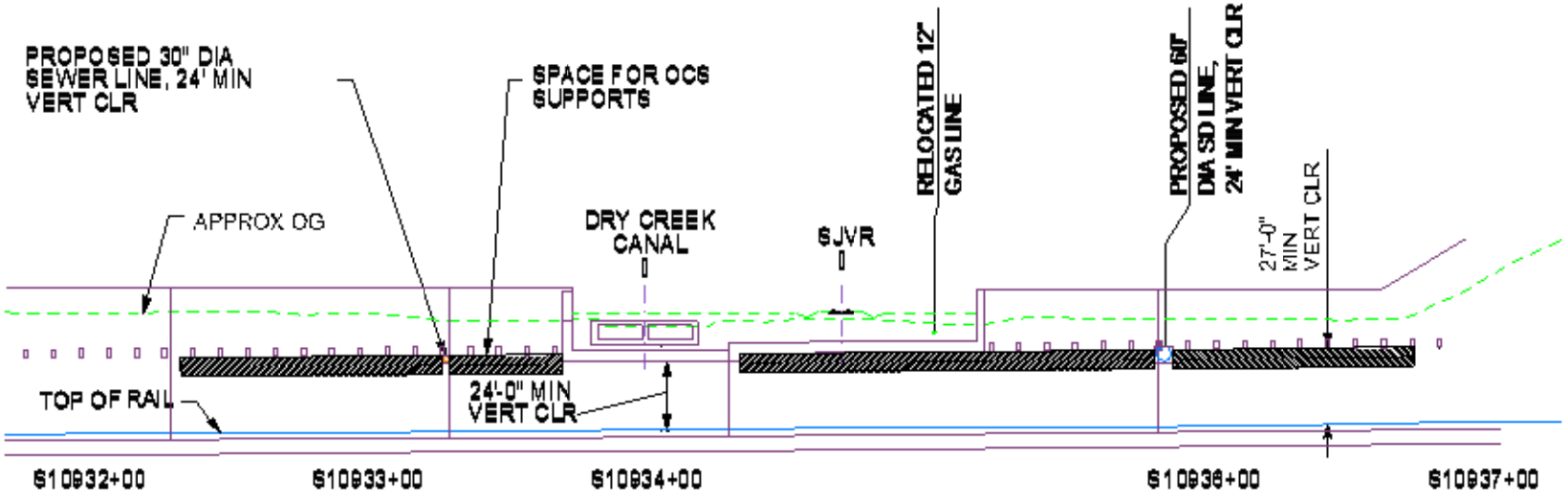
06/29/2012 ADDENDUM 3 - RFP HSR 11-16

Sketch 1

Revised Negative Feeder Location

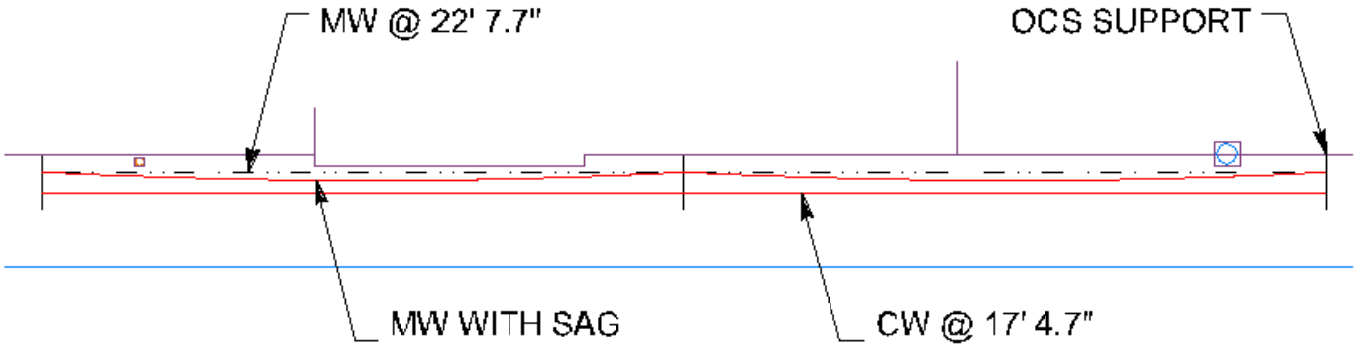


Note: Circles represent 13” required clearance to negative feeder and 26” clearance to catenary metalwork.



OCS SUPPORT LOCATION IN 27' HEIGHT CLEARANCE AREA

NO SCALE

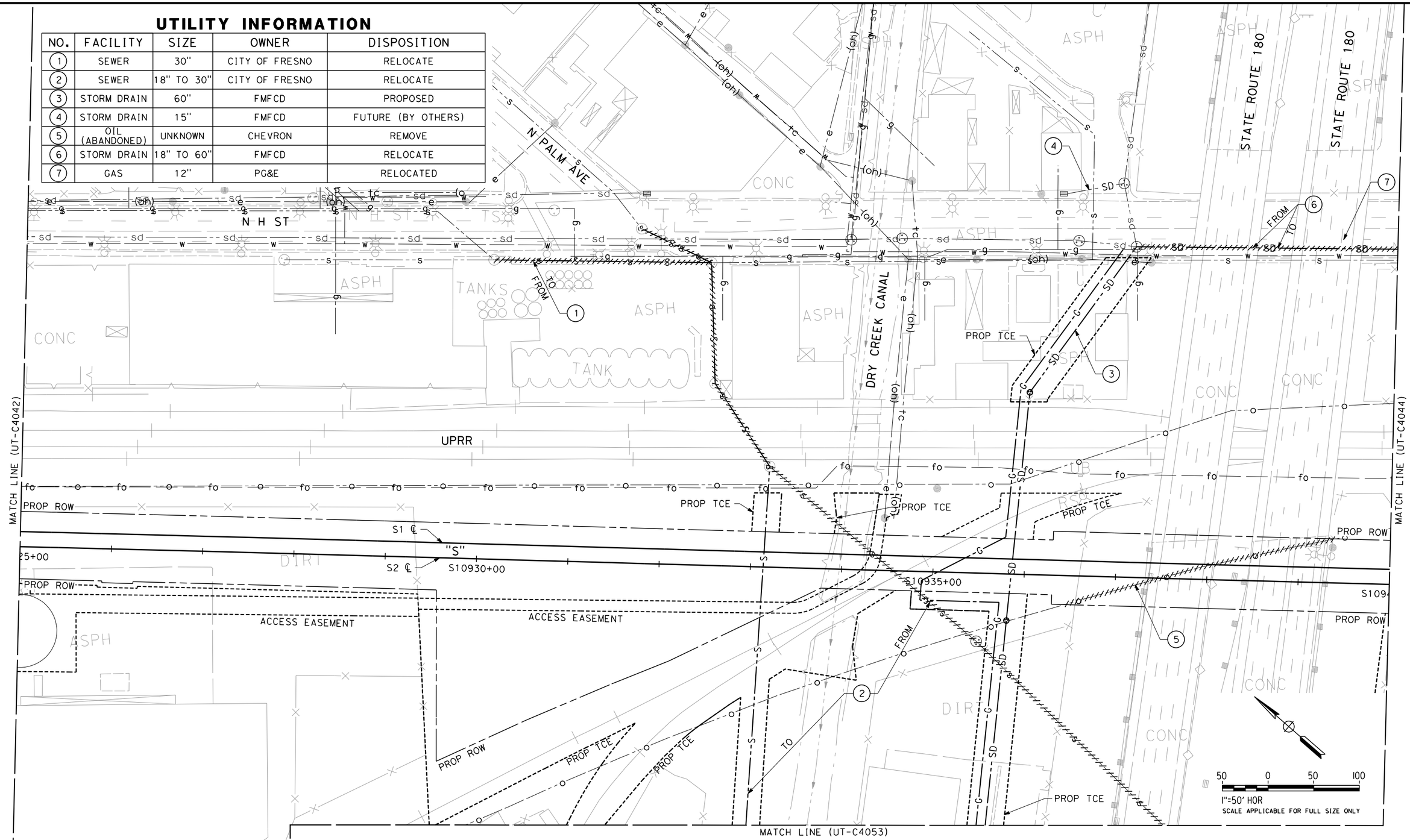


OCS PROFILE (Typical, hangers not shown))

NO SCALE

UTILITY INFORMATION

NO.	FACILITY	SIZE	OWNER	DISPOSITION
1	SEWER	30"	CITY OF FRESNO	RELOCATE
2	SEWER	18" TO 30"	CITY OF FRESNO	RELOCATE
3	STORM DRAIN	60"	FMFCD	PROPOSED
4	STORM DRAIN	15"	FMFCD	FUTURE (BY OTHERS)
5	OIL (ABANDONED)	UNKNOWN	CHEVRON	REMOVE
6	STORM DRAIN	18" TO 60"	FMFCD	RELOCATE
7	GAS	12"	PG&E	RELOCATED



06/29/2012 ADDENDUM 3 - RFP HSR 11-16

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY C. ALLEN
DRAWN BY C. DOEHNE
CHECKED BY M. POLISCHUK
IN CHARGE J. LABANOWSKI
DATE 12/08/11

PROPOSED PRELIMINARY DESIGN

NOT FOR CONSTRUCTION

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SIERRA SUBDIVISION
PACKAGE 1A
UTILITIES
COMPOSITE UTILITY PLAN
STA. 10925+00 TO STA. 10940+00

CONTRACT NO.
DRAWING NO. UT-C4043
SCALE AS SHOWN
SHEET NO.

mark_polischuk 2/8/2011 10:59:25 AM CAHSRP-r1.tbl CHSR_PDF_half_black.plt P:\27560808\03-RPLANS\MASTERS\30% Procurement\Sheet Files\Package #1\UTC\FB-UT-C4043-PK1A.dgn

Fresno Metropolitan Flood Control District
August 15, 2011
Meeting Notes

HST Section: Fresno to Bakersfield

Meeting Date: August 15, 2011

Location: FMFCD Office, 5469 E Olive Ave, Fresno, CA 93727

Purpose: Coordination

Participants: Jerry Lakeman, 559-456-3292, FMFCD
Mark Will, 559-456-3292
Alan Hofmann, 559-456-3292
David Pomaville, 559-456-3292
Melisa Bittancourt, 916-567-2568, PB
Johnny Kuo, 415-243-4683
Scott Lanphier, 916-915-2700
Garry Horton, By Phone, 916-784-3900, URS
James Labanowski, 916-784-3900
Carlton Allen, 916-784-3900
Stephen Burges, 415-957-9445, ARUP
Grant Schlereth, 415-946-0246
Robert Henderson, By Phone, 714-435-6143, CH2M Hill

Prepared by: Carlton Allen

Action Items:

- Scott will coordinate with Alan on agreement
- FMFCD to provide soil data
- FMFCD to provide existing drainage flows and data

Discussion of Issues:

- James gave the introduction/background of design development process
- FMFCD prepared a solution as well for discussion.
    - The pipe would cross under the trench in its existing horizontal location and outlet into the basin. The outlet of the pipe would be lower than the existing floor.
    - A concrete trench/spillway would convey the water into the basin. The spillway would have to be wide enough for maintenance to occur (using a Bobcat to clear silt).
    - Proposed to expand the basin north under the Belmont OH.
- James then led the discussion on the five alternatives proposed in the memo
    - Alternative 1 (Gravity Under HST, Deepen Basin)
        - Similar to FMFCD's proposal
        - Increased maintenance compared to existing

Fresno Metropolitan Flood Control District
August 15, 2011
Meeting Notes

- Alternative 2 (Pumped Over HST)
  - Pump station on east side of UPRR is an issue
  - FMFCD would prefer to dismiss this alternative based on the need to maintain more pumps
- Alternative 3 (Gravity Under HST, Reroute System)
  - Additional headloss from extended length of pipe a concern for FMFCD
- Alternative 4 (Sag Culvert Under HST)
  - FMFCD prefers their spillway idea for ease of maintenance
- Alternative 5 (Gravity Over HST Without Pump)
  - FMFCD agreed that is not a feasible solution
- FMFCD considered Alternatives 1 and 3, along with their solution as the feasible options

- Surface Drainage
  - FMFCD, FID, and City of Fresno must approve discharges to Dry Creek.
  - Pumping directly to Dry Creek was not considered favorable.
  - Flow from HST system must be attenuated to pre improvement rate before it enters the FMFCD system.
    - FMFCD will provide Q they will accept into their system
- The Belmont underpass has not flooded since the 96" storm drain was built (2001).
- FMFCD is also concerned about road improvements and where flows will go.
- FMFCD would review design at no expense.
- FMFCD would like to be paid for work associated with the relocation of existing facilities.
- FMFCD would assess the Authority a drainage fee
- Who will maintain new basins that are constructed by the HSTP?
- Jerry said that FMFCD has approx. 1.5 million CY of material east of town in basin sites that can be excavated.
- FMFCD has soil samples for most basin sites.
- There are also several basins to the south and west of town that have available material to be excavated.
- One location has higher than background lead levels
  - Would provide this material at no cost
- FMFCD would like to tell contractors they have available fill, how can they do this?
  - How will they know who is bidding on the project?
    - PMT discussed the Industry Forum happening on September 8th.
- FMFCD could not find description in EIR of borrow material.
- Basin EH – meeting with between MF team and FMFCD to follow
- HSTP schedule was discussed.

URS/HMM/Arup Joint Venture

California High-Speed Train Project
Fresno - Bakersfield

City of Fresno
October 21, 2011
Meeting Notes

HST Section: Fresno to Bakersfield

Meeting Date: October 21, 2011

Location: City Hall, 2600 Fresno Ave, Fresno, CA

Purpose: Utility Coordination

Participants: Scott Mozier, 559-621-8811, City of Fresno
Doug Hecker, 559-621-8554
Robert Anderson, 559-621-8610
James Labanowski, 916-784-3900, URS
Mark Polischuk, 916-784-3900
Johnny Kuo, 415-243-4683, PB

Prepared by: Mark Polischuk

Action Items:

- URS to prepare a large strip map of proposed utility work for the City of Fresno.
- City will double check the manholes inverts along the sewer line in question near the Dry Creek Canal.
- URS to check benchmarks of topo survey done to compare to City of Fresno information that may identify where the differential between elevations is coming from.
- URS to check in with structures to identify whether adjustments could be made to allow for the sewer line.
- URS to check and confirm the sewer lines at Church Ave including two private lines.

Discussion of Issues:

- James gave the introduction/background of utility development process. Emphasized that we would like to focus on the sewer line that is in conflict with the trench structure near Dry Creek Canal.
    - City wanted to know if the structure could be adjusted to allow the sewer line to pass by without conflict.
    - City also suggested that we could look at the existing sewer line facility in greater detail and see what sort of impact would occur if we were to chase the elevation differential needed back through the system to make up the difference. Also included pipe replacement and possibly size in the analysis.
    - City suggested looking at placing a siphon in the canal at the point of conflict to avoid the sewer line.
    - City was highly opposed to a lift station and would like to avoid it at all costs.
- It was noted that all water lines need two points of service for each parcel. A consideration for all water line proposals.